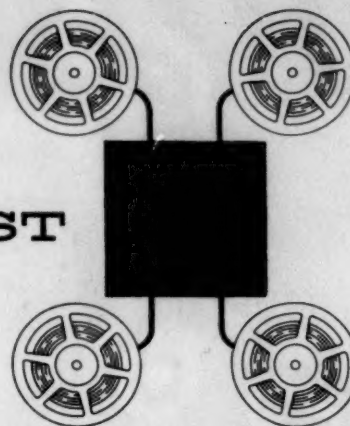


DATA PROCESSING DIGEST

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Systems Design

0 INFORMATION PROCESS ANALYSIS

Burton Grad, General Electric Company; and Richard G. Canning, Consultant
THE JOURNAL OF INDUSTRIAL ENGINEERING, November-December 1959; pages 470-476.

Information Process Analysis is a charting technique developed by General Electric Company to aid in the introduction of electronic data processing systems in the office. The systems aspect of information processing cuts across existing functional lines in the development of new procedures. This contrasts with past practices where the emphasis has usually been on cost improvement in certain portions of a business organization. Most of these latter projects disregard the inter-relationships between the various activities of the business.

In a systems study, the analysis must be much more comprehensive than the usual "procedures" analysis. Improving a particular process or activity is not the primary goal. Rather, the emphasis is on examining the necessity for having the process at all. The Information Process Analysis was designed to meet the needs of such a systems study.

The person beginning an EDP systems study is more interested in what is going on in the business than in how it is being performed or who is performing it. For example, he is not interested in the manual procedures that are used, in themselves. Nor is he interested in the fact that several people are involved in an operation, nor in the layout of the clerical work area or types of equipment used. He is not interested in the "exceptions" which arise because of internal clerical errors; but he is interested in the types of information errors transmitted into the organization from outside, over which the organization has no control.

He is interested in these types of information:

- "1. The logically necessary alternative procedures which are needed in the business for handling main line flows as well as so-called 'exception' cases.

CONTENTS

- 1 Systems Design
- 4 Management Sciences
- 5 General Information
- 14 Applications
- 17 Equipment
- 18 Comment
- 20 References
- 21 Training
- 22 Meetings

*Symbols for data
processing operations*

2. The management control reports that are developed by the organization, and the purposes they serve.
3. The reports and other pieces of information that must be transmitted outside of the organization, for legal or other reasons.
4. At first, a preliminary pin-pointing of all complex computation operations and decision areas. Later we will need a more detailed understanding of these operations."

The Information Process Analysis technique is based on reasonably precise definitions of basic data processing operations, represented in the form of symbols; and a charting procedure to make sure that the necessary descriptive information accompanies each symbol. Seven symbols are used, five representing operations and two representing connective devices. There are variations for some of the symbols, so that altogether, 11 different terms are used. These are:

Search. Search means to extract a particular record from a file of similar records which are sequenced by the field on which the search is being conducted; for example, search the Planning File for the Planning Card covering part number X.

Separate. Separate means to select one or more records from a group or file, according to a key field. Sequencing by the key is not necessary. For example: separate the copies of the Purchase Order by destination.

Sequence. Sequence means to arrange (or sort) a group of records into ascending or descending order according to a key field; for example, sequence time cards by employee pay number.

Merge. Merge means to combine two or more groups of records which are already in sequence by one or more key fields into a single sequence on the same keys, or to place a record in a file; for example, merge new Parts List with the Parts List File by Parts List number.

Insert. Insert means to create a new record or to add one or more fields of information to an existing record; for example, prepare a new Purchase Order, or sign a Freight Bill.

Delete. Delete means to remove one or more fields of information from an existing record; for example, delete a terminated employee's pay number from the active employee ledger.

Compute. Compute refers to an arithmetic formula incorporating basic arithmetic operations.

Compare and Branch. Compare and Branch is the basic choice operation which involves a defined or fully prescribed decision; for example, if the product number is incomplete, then pass the order to Engineering.

Choice symbols

Decision-Making. Decision-Making is a higher level than Compare and Branch. It is used when a choice is not based on a clear cut set of rules. For example, determine the quantity of Model XYZ that will be sold within the next 12-month period.

Entry. An Entry serves to start a routine or to bring additional information into it from another part of the same chart or from a different activity.

Exit. An Exit is the means by which an activity is terminated. It may go to another part of the same chart, to another activity, or it may be the end of the routine.

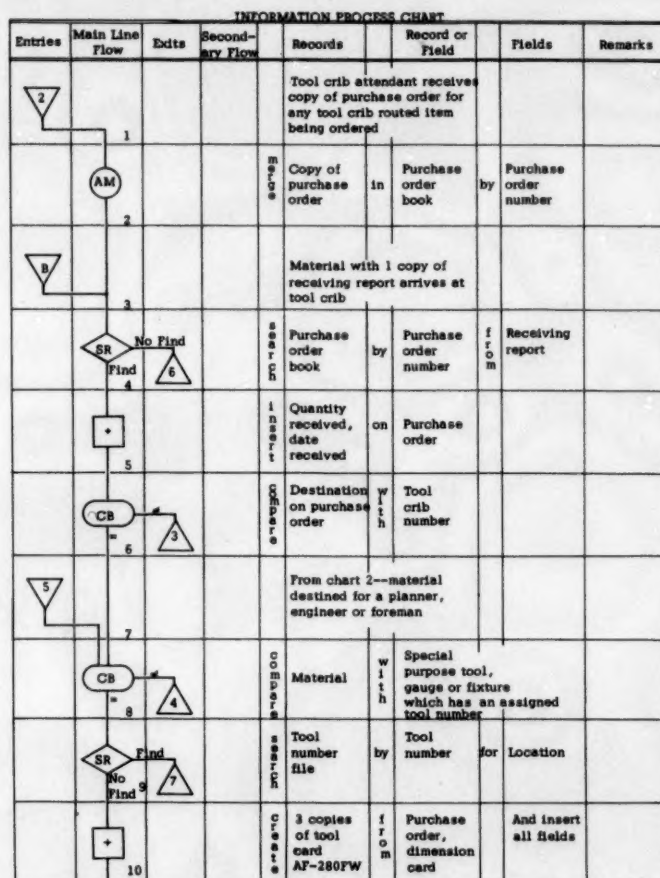


Figure 3, reproduced from the original article, is a reproduction of one part of a chart on tooling activities in a manufacturing organization. It illustrates the charting of the receipt of raw material at the tool crib, where the material is destined to be made into a tool. All entries are shown in the first column. The next column is the main line, or the sequence of steps being described. The exit column is similar to the entry column. A secondary flow column is provided to reduce the need for exiting and re-entry to handle minor variations in procedure. The use of this column should be quite restricted. No separate entries should be made to this column; it is reserved for branches out of the main line via Compare and Branch, Search, Separate, or Decision operations. If the secondary flow involves more than six operation symbols, an exit should be made to another page of

the chart, where it is charted in the main line. The three narrow columns without headings are for inserting prepositions, conjunctions or verbs to clarify the meaning of the activity.

The operation of "reading" is not called out as a separate step. It is assumed that the person or machine doing the processing must first read the information from the documents.

Management Sciences

GAMES, GAMES, GAMES

Paper by Roger L. Sisson, Aeronutronic, Div. of Ford

The word "game" is used in three ways in operations research and management science:

1. Education games--the process of creating a general model which is then used for educational purposes;
2. Theory of games--a specific mathematical formulation useful in representing competitive situations;
3. Operational gaming--a procedure for solving simulation models by repeated trials.

Three kinds of games

The simplest version of the theory of games becomes linear programming, a useful technique in many business situations. At the present time, more sophisticated applications of the theory of games must be considered research.

Operational gaming is used by those attempting to apply operations research in complex situations. Management must be willing to invest a fair amount of money in a research program in which the return is uncertain. The investment in simulation and operational gaming is risky, but the payoff can be very high.

Educational gaming is of great and immediate value to all business people. Educational games teach the student decision-making processes and techniques and encourage self-confidence in decision-making itself. They are especially useful in teaching the fact that models, especially the operations research type, are valuable, and also in teaching how they may be used. Educational games are inexpensively devised and quite easy to use. However, the step between an educational game representing a particular business and a useful simulation of that business for decision making purposes is a gigantic and expensive step and should be undertaken with care.

A copy of the complete paper may be obtained from the author at Aeronutronic, Division of Ford Motor Company, Newport Beach, California.

MANAGEMENT SCIENCE—A NEW ORGANIZATIONAL DIMENSION

Proceedings of Joint Conference of The Institute of Labor and Industrial Relations and TIMS Detroit Chapter, April 1959

*Definition of field
is needed*

A one-day conference on the meaning of management science was held in April 1959 in Detroit, Michigan. It was sponsored by the Detroit chapter of The Institute of Management Sciences and The Institute of Labor and Industrial Relations of The University of Michigan and Wayne State University. The keynote speaker, Mr. Ferry Allen, Michigan Bell Telephone Company, pointed out that management scientists need to clarify the meanings of their field. "Is management science a single integrated discipline covering the entire field of management? . . . If it isn't such a single integrated discipline today, what is the likelihood that it will be in the foreseeable future? Or on the other hand, is it a group of related scientific disciplines? And if so, what are the common attributes which tie these together in the sense that we speak of the physical sciences, or the social sciences? . . . Or finally, is what we are talking about merely a group of techniques, many of them newly-developed in other areas, which are wandering around in the business field looking for a place to apply themselves, and not really 'science' in the strict sense of the word, but rather 'technology'?"

The papers which followed did not attempt to answer these questions. Rather, they were detailed examples of the use of techniques such as mathematical programming and queuing theory, simulation and model building, and statistical analyses. The luncheon speech was a description of operations research activity in Japan. The proceedings may be ordered from the Institute of Labor and Industrial Relations, at either Wayne State University Student Center Building, Detroit, Michigan; or Hutchins Hall, Ann Arbor, Michigan. Price \$1.00.

General Information

THE AUDITOR'S NEW TOOLS

Edward T. Shipley, Wachovia Bank and Trust Company, Winston-Salem, N. C.
AUDITGRAM, January 1960; pages 4-7

The auditor has five areas of concern in an EDP system. These are: the input media, which are the most susceptible to error and require the greatest degree of control; the memory unit, the accuracy of which depends on the control of the input; the arithmetic or logical component, where the accuracy of the program is important; the output devices, which provides the check point for the accuracy of all the preceding steps; and the "control area" which is the system design itself, assuring that the end product is directly related to the data received originally in the data processing center.

Control over the areas of human effort are the most critical. This area includes the preparation of the source documents, the programming of the equipment, and the review of the end product. Only infrequently does the computer originate data, for example, determining the service charges on checking accounts. This need not be a critical point, if the system of checks and reviews will reveal errors or other inaccuracies. For example, in the case of service charge entries, a comparison of the charges developed within each control for one month with the totals developed on the same control the prior month, should disclose any serious deviations.

Auditing by exception

A more sophisticated approach to control may be the design of programs specifically for the audit function, in which the machine scans recorded data and calls to the attention of the auditor any exceptions or variations from predetermined accounting methods and results. This would be auditing by exception.

Most computer installations provide protection from irregularities because the data origination and the data processing areas are separated, and it is unlikely that one person could gain sufficient knowledge of the entire operation of the bank that false entries could be processed through the entire system without detection.

With proper programming, the computer can note the exceptions that may bear further investigation, assisting the auditor in the performance of his job.

BIG SWING TO BANK AUTOMATION PREDICTED

AUDITGRAM, January 1960; page 39

It is predicted by Neal J. Dean, of Booz, Allen & Hamilton, that by 1961 to 1965 most large banks will have converted or be in the process of converting demand deposit accounting to electronics, and that smaller banks will follow shortly thereafter, perhaps using computing centers or the facilities of correspondent banks. He also foresees many transactions such as employee wages, insurance payments, tax payments, supplier payments and customer receipts being handled automatically by banks.

BANKAMERICARD—A SOPHISTICATED CREDIT SYSTEM FOR CALIFORNIANS

MANAGEMENT AND BUSINESS AUTOMATION, January 1960; pages 18-21, 40, 41

The Bank of America has set up the Bankamericard system with 26,000 merchant members who honor the credit cards throughout the state. Information for the system is a network of long distance lines connected by local numbers to three centers, in Pasadena, San Francisco, and Sacramento. In each center the customer records for that portion of the state are kept on punched cards in number se-

quence. The customer's credit card contains, in addition to normal identification data, a nine-digit account number and a code indicating the credit limit for an individual purchase. The account number is printed in the E-13-B type face for future integration with the bank's MICR system.

((It is noted that this system does not provide an up-to-date record of the customer's credit rating and status of his account. This is a serious problem in the retail field, and credit authorization will be a subject demanding much attention from retailers in the near future.))

BUSINESS EXPERIENCE WITH ELECTRONIC COMPUTERS

*B. Conway, J. Gibbons, D. E. Watts, Price Waterhouse & Co., New York
Published by Controllers Institute Research Foundation. 1959. \$5.00.*

The sub-title of this report reveals its purpose and scope: "A Synthesis of What Has Been Learned From Electronic Data Processing Installations." Seventeen of the most prominent companies who have pioneered in the use of EDP have contributed information about their experiences. The authors of the book have distilled this experience into general principles for management guidance.

The report is "aimed principally at those who have been assigned responsibility for making the initial decision and for the planning, supervision, control and ultimate success of the electronic program itself." In addition, top management, who are first and last responsible for the success or failure of the installation, will find this book of value in acquainting themselves with the intricacies and vast detail of "getting on the air."

The book is divided into six parts: Making the Decision; Preparing for and Introducing Electronic Equipment: Company Education and the Programming Group; Preparing for and Introducing Electronic Equipment: Development of the Applications and Conversion from Prior Methods; Operating Electronic Equipment; Relations with the Manufacturer; and Some Unresolved Matters and Some Thoughts on the Next Five Years.

Because of its practical information based on actual experience, written in a straightforward and condensed manner, and its convenient and usable form, this report can be included among the top books in the field.

WHEN IS A FEASIBILITY STUDY FEASIBLE?

Ralph Weindling, Urwick Diebold Ltd.
AUTOMATIC DATA PROCESSING, January 1960; pages 7-9

Some difficulties in setting up a team to perform a justification study are these: It creates a group that sooner or later identifies itself with an automatic data processing approach; their bias tends in favor of a computer so that they tend to arrive at an affirmative answer. In those cases where the study result is negative, the persons chosen for the study effort must be re-absorbed in their old positions. The existence of the study group can cause apprehension among the rest of the employees about the future of their jobs in the event a computer is acquired.

Whether or not the organization of a study group is called for is a decision management finds hard to make, for not to do so may be more expensive than to do so and find a computer is not required. Some criteria are given for making this basic decision.

A list of rules on which to base this decision follows:

1000 or more employees

"1. Any company or organisation with more than 1,000 employees should undertake a serious justification or feasibility study. This statement would not hold under the following conditions:

- a. The firm's operations are such that they do not meet the criteria set out below for the company with fewer than 1,000 employees.
- b. The limitations or restrictions mentioned in the last section of this article apply.
- c. The basic requirements that are indicated below are less than half way to being fulfilled.

2. For industrial or commercial firms which physically handle goods or merchandise, a serious feasibility study should be undertaken if a majority of the following conditions apply, or if items (a) and (c) apply.

- a. Present costs for clerical activities (order processing, payroll, production planning and control, inventory control, etc.) at any one location exceed £1,500 per month.
- b. The size of the product line is such that present methods do not allow records to be economically kept down to the lowest classification or differentiating factor (colour, packing, size, style, etc).
- c. Better or speedier or more scientific inventory control for finished goods, production parts and in-process inventory would result in inventory reductions, whose 'carrying costs' are worth \$£12,000 per year. A study to determine this can be made quite independently of a feasibility study. Some of the questions involved are:
 - i. What is the annual cost attributable to carrying £1,000 worth of inventory?

ii. To what extent is the inventory subject to reduction? Limiting factors include decentralised locations each with the need to carry a full line; levels dictated by buying to take advantage of price fluctuations; adequate information on the finished goods inventory existing at the present time.

iii. To what extent are inventory records dictated by people who would not receive the improved data? For instance, if policy is to produce whatever is requested by the local sales offices, centralised inventory data would be of value only to the extent that trans-shipment is possible and desirable.

d. Delayed or late deliveries are a serious problem.

e. Lost items in the production process, excessive use of expeditors, unused machine capacity and recurrent crises situations cannot be economically corrected by present methods.

f. Decentralised operations, over which central control or information would be desirable.

*Clerical work exceeding
2000 pounds per month*

3. For non-industrial companies whose main visible physical output is paperwork (banks, insurance companies, utilities, brokers) the main criterion would be clerical costs in excess of £2,000 per month.

BASIC REQUIREMENTS

A company considering automatic data processing for any type of production planning, production control, or control of stocks must have the following applicable basic requirements:

1. Time standards of reasonable accuracy.
2. Accurate and up-to-date material sheets, indicating the components of each item.
3. Reliable operation sheets, indicating the production steps for each part and product.
4. Adequate reporting of pertinent activity (production, waste, withdrawals, receipts).
5. Consistent numbering or coding systems (parts, operations).
6. Usage records.
7. Machine or works centre capacities.

If those of the above requirements that apply are not at all fulfilled, it would be advisable to start with more basic elements than an automatic data processing feasibility study. However, it is certainly wise to undertake these steps so that the results are compatible with an automatic or mechanised system.

LIMITATIONS

The above rules of thumb are subject to the following limitations:

1. A completely decentralised organization must make its evaluations in terms of individual units, rather than total size or activity. Headquarters, either as they are at the present time or as they should ideally be, would be one of the units.

2. Clerical personnel who would in any case be required (cashiers, customer service personnel, etc.) cannot be part of the basis of consideration.

3. Legal or 'traditional' restrictions that would prevent changed formats and media negate some of the possibilities."

HOW TO UP COMPUTER OUTPUT

CHEMICAL WEEK, January 9, 1960; pages 65, 66

Chemical companies are using two approaches to developing ways of using their computing centers to full capacity. These are:

1. Diffused--selected personnel from each of a company's major divisions are brought together to learn the basics of computer usage; these persons are then charged with disseminating programs throughout each division. This approach is used by Allied Chemical.

2. Concentrated--each division is brought through an intensive step-by-step program, often on a staggered schedule, so that as one division finishes a step, another is just beginning it. This approach is used by Merck. The program was implemented by a committed called MAPDEV (Merck Application Development Team), composed of operating and management men from all divisions, which did a comprehensive job of education and laid the ground work for the data collection systems which developed.

SOLVING THE HUMAN PROBLEMS OF AUTOMATION

THE MANAGEMENT REVIEW, January 1960; pages 63-65

Some suggestions and agreements are given by union and management spokesmen for relieving the fear of employees whose jobs appear to be endangered by automation.

1. Inform the workers as far in advance as possible. This gives unions a chance to make suggestions for minimizing possible dislocation problems and gives workers who have to find other jobs a chance to do so. Also, the sense of participation often helps gain acceptance for the new equipment.

2. Provide for retraining. Union leaders say workers should be tested to determine their adaptability; and those with seniority should be given first chance at the new work.

3. Regarding pay, the unions want the worker on the new job to be paid at his old rate for a trial period. Then, if the new equipment results in increased productivity, the new wage rate should be scaled higher. However, where the only work available for a displaced worker carries a lower wage than his old job, he should be paid at the old rate for a specified period of time.

4. Relocation costs brought about by automation were borne by the company, not only for supervisors, but also for workers, in a few instances.

5. Permanent layoffs have been compensated with severance pay benefits in several management-union agreements.

WHY NOT CENTRALISE? A CURRENT ADP QUESTION

O. & M. BULLETIN, October 1959; pages 212-216

Her Majesty's Government has found that decentralized computer systems which integrate all the data processing needs of a small local department or area are superior to large centralized centers which operate on the principle of mass processing of functions, such as payroll. The reason is that, particularly in the case of payrolls, the boundaries of pay accounting are ill-defined. "It may, or may not, include, for example, calculation of gross pay, sick-leave recording, automatic granting of increments, . . . and so on. Clearly, although all these facets could be integrated on a departmental A. D. P. installation, many of them could only with difficulty be assumed by a central installation, and it can be taken for granted that the processes centralised would be only the least common denominator in payroll work--probably the calculation of gross pay to net, ending with the preparation of the payroll to be forwarded to the department. Centralisation thus means the minimum of integration with other processes. . . . Unless some degree of interdepartmental standardisation could be secured, the central installation would require a small army of programmers to write the hundreds of computer programmes that would be necessary."

The preference for decentralization is based on the amount of systems integration that a decentralized system can encompass. Many of the local operations can be integrated into one system, with by-product reports and operations resulting from the main processing runs. On the other hand, central computers may be useful on an agency basis for overflow work, work for departments that cannot justify an installation of their own, and ad hoc tasks that arise.

THE ACCOUNTANT AND THE ELECTRONIC SCIENTIFIC COMPUTERS

*William G. Britt, Royal McBee Corp., Dallas, Texas
COST AND MANAGEMENT, January 1960; pages 22-26*

The accountant has several duties in connection with a computer installation in his company. First, he must make decisions about the computer as they affect the accounting phase of the work. Second, he must be able to advise management on the type of computer that will best fit the needs of his particular organization. Third, in many companies, he must be able to coordinate all computer activity, whether it will be a centralized or a decentralized set-up.

THE AUDITOR USES THE COMPUTER

Thomas E. McCullough, Consolidated Edison Co., New York
INTERNAL AUDITOR, December 1959; pages 34-38.

The entire concept of auditing will be changed when a computer is used. Use of a computer permits the auditor to increase tests in certain audit areas in a large company where previously tests were limited to 5 or 10 percent because of the volume of items and the time consuming aspects.

One method of internal control which can be included in EDPM programs is the "internal control log," an effort to establish continuity and agreement among successive, related computer runs. For example, in Stores Stock Record and Stock Control Runs, the number of transactions is controlled, and each run passes this control total on to its succeeding run.

So that the auditor may be sure a program is operating satisfactorily, a test deck consisting of the cards which were used to test the sub-routines during programing may be obtained, along with the attendant tapes. From these a set of output reports may be obtained which may be verified by the auditor and serve as the basis for comparison of all future tests of the computer program.

The console log may be used by the auditor for control purposes. The explanatory notes on the log sheets will show the progress of a program, and any variations which were made during the run.

THE ROLE OF CHARACTER RECOGNITION IN EDP RETAIL APPLICATIONS

Henry F. Sherwood, Touche, Niven, Bailey & Smart
STORES, December 1959; pages 46, 47.

The entering of sales information, and the production of customer statements which can be used as later input documents are two facets of the automation problem faced by the retail stores. The point-of-sale recorders failed largely because of the cost of equipment. It appears that some form of optical scanning or magnetic reading device will be the answer to the input problem, but presently available devices are not desirable for two reasons: there is no provision at present for re-entry printing, and at the point of sale an El3B type font impression must be created on documents. At present no sufficiently reliable imprinter is available.

The use of an optical or magnetic character recognition device depends upon the carrier--the credit plate. Stores are advised to obtain new plates suitable for character sensing as they need to order new ones. Whatever reader-sorter is used, it should be able to process paper documents as well as punched cards.

ANNUAL SURVEY AND FORUM

THE OFFICE, January 1960; entire issue

Each year The Office devotes its January issue to a review of electronic data processing. Thirty-two articles—averaging three pages—by persons active in the field, are published. These include consultants, users, and equipment manufacturers. Related articles in office management are also included. Some of the titles are: "The Computer Is Just One of Many Managerial Tools," "How to Conduct the Computer Feasibility Study," "Life Insurance Companies Have Long Used Computers," "Providing Audit Trails in Computer Operations."

AN ANNOTATED BIBLIOGRAPHY

UNIVAC EDUCATIONAL SERIES NO. 3

A revision of the Univac Remington Rand bibliography published in 1956 has been updated to include many books and articles published in 1958. Also included are indexes, bibliographies, glossaries, and a list of periodicals devoted partly or entirely to computers. The sections are divided into Theory and Operation, Applications, and General Background and Sources. Contact local Remington Rand offices for a copy.

UNITE EDP TRAINING, ACCOUNTING IN NEW BUSINESS SCHOOL COURSE

OFFICE EQUIPMENT AND METHODS, November 1959; page 29.

The Automation Institute of America, Inc., of San Francisco, has initiated a course of study in a chain of business colleges which combines general accounting and machine accounting. It is available both to individual students and to business firms arranging "package" training for employees. ((The course appears to be confined to punched card accounting, but is a step in the right direction toward introducing courses in electronic business systems into business schools.))

INOVA CORPORATION

A group of scientists in the State of Hawaii has organized INOVA Corporation, a non-profit corporation for research and development work in the physical, mathematical and biological sciences. The purpose is to provide Island employment for Island science graduates and a temporary working place for visiting scholars from all parts of the Pacific and from the Far East. Information about INOVA may be directed to Cecil Hastings, Jr., Secretary of INOVA, Box 5227, Honolulu 15, Hawaii. ((From a news release.))

Applications

PROCESSING AN AVERAGE OF 90,000 CHECK AND DEPOSIT TRANSACTIONS DAILY

S. J. Kramer, RCA, Camden, New Jersey

COMPUTERS AND AUTOMATION, January 1960; pages 10-12

A pictorial diagram of the manner in which the Fidelity Philadelphia Trust Company processes demand deposit accounting on its RCA 501 System is given in this article. The sequence of the system is as follows:

1. First computer pass: proof run to verify batch totals. Unbalanced batches are printed out for clerical editing and correction.
2. Second computer run: All transactions are sorted into account number sequence. If there are ten or more checks for an account, they are summarized into a single transaction, while the separate items are printed out on a list to be attached to the checks and mailed with the statement.
3. Third computer run: A punched paper tape of miscellaneous transactions (name and address changes, new accounts, stops, holds, corrections of unbalanced batches, etc.) is merged with the sequenced regular transactions on magnetic tape.
4. Fourth computer pass: Main posting run, updates the master file, generates the daily trial balance tape, which is printed out, and senses the transactions for various reports.
5. Fifth computer run: Edits and extracts the data for the various special reports, and arranges the information for the desired format. It generates a data tape of the month's account activity and computes the service charges for statements for the accounts whose statement cycle falls each day. It also generates the magnetic tapes of data to be printed out for the analysis summary of those accounts receiving statements.

DON'T BE AFRAID OF COMPUTERS

Claude D. Brown, Economy Forms Corporation

AMERICAN BUSINESS, January 1960; pages 6-9

Economy Forms Corporation is a 300-employee company with \$5 million in annual sales, which manufactures steel forms used in concrete construction. The company has nine warehouses which distribute the forms for rent or sale. Early in 1959 the company installed an LGP-30 which it uses to process a complex payroll, make sales analyses, compute accounts receivable, and handle production control.

The approach of the company has been in terms of the total integration of the company's activities.

((Correspondence with the company resulted in additional information as follows:

"In answer to your questions on our accounts receivable operation, our customers are filed numerically. In writing invoices, we use an edge-punched card for each customer. The material is summarized on punched paper tape, which is fed into the computer. The main function of this tape is to receive an income analysis. To maintain a constant check and balance and to insure that the debits to the customer's accounts equal the credits to the income accounts, the computer analyzes the tape once for income analysis, a second time for a change in accounts receivable; the two must be equal. The computer's answers in accounts receivable are checked against the customer's ledger card. This serves two functions: 1. To insure that all invoices were posted correctly to the customer cards, and 2. To insure the invoicing data has been punched correctly on the by-product punched paper tape. At this time we provide no credit check or credit limit. This step certainly is possible but it has not proved to be a problem in our organization."))

SPEEDY ANSWER TO A PUBLIC MANDATE

R. O. Keim, Commonwealth of Pennsylvania
SYSTEMS MAGAZINE, November-December, 1959; pages 8, 9

The Commonwealth of Pennsylvania is using its Univac installation, installed in 1958, to process Pennsylvania's Korean War Bonus. The Flow-Matic automatic coding system was used, allowing the two programmers assigned to the job to complete the programming before the set target date. Only five days training in Flow-Matic were given the programmers (whose past experience in programming totalled one year). The system first tests the validity of the claim, then tests for false claims by testing Armed Forces Serial numbers. It then computes the bonus, testing the amount against the \$500 maximum payment; prepares the check register and other paper work; produces a running report of all claims paid to date; and prepares a monthly statistical report on paid claims. The system was planned to process 2500 to 3000 claims per day.

SO. CALIF. EDISON WILL INSTALL HONEYWELL 800

The Southern California Edison Company will install a Honeywell 800 computing system to handle the billing of one million customers in the Los Angeles area. The computer will process about 25,000 statements per day. The system will also eventually handle both general accounting and engineering problems. ((From a news release.))

ELECTRONIC COMPUTER PLOTS FLIGHT PLANS FOR JET SERVICE

United Air Lines is using a Bendix G-15 at its Denver operations planning center to determine flight plans for all of its new DC-8 jets. In addition to selecting the best route, the computer also relieves pilots and dispatchers of much computation work. It automatically processes all flight data and weather information to find the best flight path available for cruise or range and coordinates the flight with the overall airways traffic movement. ((From a news release.))

ELECTRONIC COMPUTER REDUCES MONTH'S WORK TO ONE DAY...

CREDIT AND FINANCIAL MANAGEMENT, November 1959, pages 16-19.

Financial Publishing Company of Boston uses a Royal Precision LGP-30 computer to compile financial statistics and tables for banks, insurance underwriters, sales finance and consumer finance companies. The computer produces tabular material which is ready for offset printing without the cost of additional typesetting or proofreading. The computer runs day and night without an operator, and produces in a working day of eight hours as many tables as were turned out previously by one man working a full month.

ENGLISH INTO BRAILLE BY COMPUTER

COMPUTING NEWS, November 1, 1959; pages 3-6.

A program for automatic translation and printing of Braille from print has been written for the IBM 704, and has been used successfully. However, because there are more IBM 650's available than 704's, a graduate student, Abraham Nemeth, working under a grant from the U. S. Office of Education, is working on a similar program for the 650. The work is being done on the 650 at Wayne State University Computation Laboratory in Detroit.

THE NORWICH CITY COUNCIL COMPUTER

*P. A. Spooner, National Cash Register Co. Ltd.
DATA PROCESSING, January-March, 1960; pages 10-19*

The City of Norwich in England uses a National-Elliott 405 computer to figure tax and water rates for 47,000 properties, prepare interest warrants and tax deduction certificates for holders of city notes, preparation of income tax and superannuation records for Council employees, and settlement of bills and claims. All records are kept on magnetic film. The Council has found it possible to reduce the cost of the computer operations by renting some spare time to local businesses.

AUTOMATED SCHOOL PAYROLL

Los Angeles City Schools will process the 45,000 employee-teacher payroll on a Burroughs 205 computer system. The system is scheduled for delivery in mid-1960. ((From a news release.))

Equipment

PRODUCTION BEGINS ON "TELLER-REGISTER"

OFFICE AUTOMATION NEWS BULLETIN, December 31, 1959; pages 8, 9

A special bank teller machine called the "Teller-Register" has been manufactured by the Teleregister Corporation for use in bank installations. Each bank teller window "Teller-Register" will be connected to a Teleregister "Telefile" electronic data processor. The new machine will eliminate the need for the cumbersome ledger cards. Instead, the teller can enter inquiry information on the device, and have the information automatically displayed in front of him. The subsequent transaction will be instantly recorded in the computer's memory. The systems are being built for Howard Savings Institution of Newark, New Jersey, the Union Dime Savings Bank of New York City, and the Society for Savings, Hartford, Connecticut.

TAPE CONVERTER

Bache and Company stock brokers are using a machine manufactured by Digitronics Corporation to convert data from magnetic tape to teletype tape at the rate of 2400 words per minute, and from teletype to magnetic tape at 3000 words per minute. This eliminates the use of punch cards as an intermediate step between teletype tape and the magnetic tape of the IBM 705 used by the stock brokerage firm. ((From a news release.))

Comment

A FOURTH READING LIST

*For beginner and
refresher study*

In this fourth annual reading list, DPD's editors present a basic group of books and articles on electronic data processing. It also contains important published work in related fields, for example, operations research. While some of the references are new, others have been retained during the four years we have offered this service. They will continue to be listed until new material of the same or better quality is published.

All of the references have been reviewed or abstracted in Data Processing Digest. The numbers at the end of each reference give the volume, month, and page, in that order, of the issue in which the review or abstract will be found. There are undoubtedly many excellent selections which do not appear on this list. However, the selections represent our opinion of the best literature that we know of in each classification. We believe this group will provide a basic understanding of the electronic data processing field for those who wish to pursue a personal program of study.

GENERAL INFORMATION

- Electronic Data Processing for Business and Industry
Richard G. Canning; John Wiley & Sons, 1955 (2-4-7)
- Installing Electronic Data Processing Systems
Richard G. Canning; John Wiley & Sons, 1957 (4-2-3)
- Cutting the Cost of Your EDP Installation
Canning, Sisson and Associates, 1958 (4-10-6)
- EDP--Its Impact on Jobs, Procedures and People
J. Douglas Elliott; The Journal of Industrial Engineering,
Sept. -Oct. 1958, pg 407 (5-1-2)
- Selecting Electronic Data Processing Equipment
Myron B. Solo; Datamation, Nov. -Dec. 1958, pg 28 (5-2-1)
- EDPM--Getting Past the Barriers to Success
D. Ronald Daniel; The Controller, Dec. 1958, pg 572 (5-2-7)
- Automation and Employment Opportunities for Office Workers
U.S. Dept. of Labor, Bulletin No. 1241 (5-3-3)
- Electronics in Business
Gardner M. Jones; Published by Bureau of Business and Economic
Research, Michigan State University (5-3-5)
- Picking the Computer's Boss--A Decision of Import
D. Ronald Daniel; Management and Business Automation, March 1959,
pg 21 (5-5-1)
- The Auditor Encounters Computers
Charles E. Grody; The Internal Auditor, March 1959, pg 31 (5-5-2)
- Can the Contemporary Executive Cope with the Computer Challenge?
E. D. Dwyer (5-6-1)
- Survey of Benefits Resulting from the Use of Electronic Data Processing
Equipment; Report published by Lybrand, Ross Bros. & Montgomery
(5-8-11)

- MANAGEMENT SCIENCES** Introduction to Operations Research
 Churchman, Ackoff, Arnoff; John Wiley & Sons, 1957 (3-3-8)
 Top Management Decision Simulation--The AMA Approach
 American Management Association, 1957 (4-2-6)
 A Comprehensive Bibliography on Operations Research
 John Wiley & Sons, 1958 (4-9-9)
 Linear Programming
 Ferguson and Sargent; McGraw-Hill Book Co., 1958 (5-2-14)
 Management Sciences
 Navy Management Review, June 1959, pg 3 (5-9-1)
 Dynamic Management Decision Games
 Greene and Sisson; John Wiley & Sons, 1959 (5-9-4)
 Teaching Executives via Simulation
 E. W. Martin; Business Horizons, Summer 1959, pg 100 (5-9-3)
- SYSTEMS DESIGN** Bank Automation (Comment) (5-1-15, 5-2-18)
 Systems and Procedures--A Handbook for Business & Industry
 Victor Lazzaro, editor; Prentice-Hall, 1959 (5-7-11)
- APPLICATIONS** Steps in Achieving Control of Material on an Electric Computer
 H. Warren White; N. A. A. Bulletin, June 1959, pg 51 (5-8-1)
- PROGRAMING** Systems Design and Programming for Variable Sized Items
 Univac Review, Summer 1958, pg 21 (5-1-8)
 Automatic Failure Recovery in a Digital Data Processing System
 Doyle, Meyer, Pedowitz; IBM Journal of Research, January 1959,
 pg 2 (5-3-7)
 Generalization: Key to Successful Electronic Data Processing
 W. C. McGee; Journal of A. C. M., January 1959, pg 1 (5-4-1)
 Random Access vs Sequenced Processing
 Navy Management Review, February 1959, pg 4 (5-5-12)
 Automatic Programming--Fact or Fancy?
 H. N. Laden; Management and Business Automation, February 1959,
 pg 29 (5-5-16)
 The Air Force Breaks Through Communications Barrier
 Miller and Jones; Univac Review, Winter 1959, pg 8 (5-7-1)
 Significant Advances in Automatic Programing (Comment) (5-8-15)
 Sesame Opens the Door to Programming Simplification
 Univac Review, Winter 1959, pg 13 (5-9-8)
 Programming Business Computers
 McCracken, Weiss, Lee; John Wiley & Sons, 1959 (5-10-11)
 Automatic Programming--What Does It Offer, How Does It Work?
 Office Management, August 1959, pg 19; and September 1959,
 pg 24 (5-11-1)
- EQUIPMENT** Office Automation Updating Service
 R. Hunt Brown, Automation Consultants, Inc. (1-11-7)

References

DATA PROCESSING DIGEST does not provide copies of the original material digested or reviewed in this issue. The publishers addresses are listed below for your convenience in writing to them for more complete information.

American Business
4660 Ravenswood Ave.
Chicago 40, Illinois

American Management
Association
1515 Broadway
New York 36, New York

Armed Forces Comptroller
516 North Oxford Street
Arlington 3, Virginia

Auditgram
38 South Dearborn St.
Chicago 3, Illinois

Automatic Data Processing
Mercury House
109-119 Waterloo Rd.
London SE 1, England

Bureau of Business &
Economic Research
Michigan State University
East Lansing, Michigan

Business Horizons
School of Business
Indiana University
Bloomington, Indiana

Canning, Sisson &
Associates, Inc.
1140 South Robertson Blvd.
Los Angeles 35, California

Chemical Week
330 West 42nd St.
New York 36, New York

Computers and Automation
815 Washington St.
Newtonville 60, Mass.

Computing News
Box 261
Thousand Oaks, California

The Controller
Two Park Ave.
New York 16, New York

Controllers Institute of
America
Two Park Ave.
New York 16, New York

Cost and Management
66 East King St. East
Hamilton, Ontario, Canada

Credit & Financial
Management
229 Park Ave. South
New York 3, New York

Datamation
10373 West Pico Blvd.
Los Angeles 64, California

Data Processing
Dorset House
Stamford St.
London SE 1, England

IBM Journal of Research and
Development
590 Madison Ave.
New York 22, New York

Internal Auditor
120 Wall St.
New York 5, New York

Journal of A. C. M.
Two East 63rd St.
New York 21, New York

Journal of Industrial
Engineering
145 North High St.
Columbus 15, Ohio

Lybrand, Ross Bros. &
Montgomery
90 Broad St.
New York 4, New York

Management & Business
Automation
600 West Jackson Blvd.
Chicago 6, Illinois

Management Review (A. M. A.)
1515 Broadway
New York 36, New York

McGraw-Hill Book Co. Inc.
330 West 42nd St.
New York 36, New York

N. A. A. Bulletin
505 Park Avenue
New York 22, New York

Navy Management Review
Supt. of Documents
U. S. Govt. Printing Office
Washington 25, D. C.

O & M Bulletin
Treasury Chambers
Great George St.
London SW1, England

The Office
232 Madison Ave.
New York 16, New York

Office Automation News
Bulletin and Updating Service
155 Fifth Avenue
New York 10, New York

Office Equipment & Methods
Maclean Hunter Publishing
Co. Ltd.
University Avenue
Toronto, Ontario, Canada

Office Management
212 Fifth Ave.
New York 10, New York

Prentice-Hall, Inc.
Englewood Cliffs, New Jersey

Stores
100 West 31st St.
New York 1, New York

Systems Magazine
Remington Rand
315 Fourth Ave.
New York 10, New York

Univac Review
Remington Rand
315 Fourth Ave.
New York 10, New York

U. S. Dept. of Labor:
order publications from
U. S. Govt. Printing Office

John Wiley & Sons, Inc.
440 Fourth Ave.
New York 16, New York

Training

Operations Research - Explained with Applications, sponsored by American Management Association

Date: March 2-4, 1960
Place: New York City (Hotel Astor)
Information: Mr. S. Charles Bleich, American Management Association,
1515 Broadway, Times Square, New York 36, New York

Organization and Management of the Data Processing Function, Orientation Seminar #657-91, American Management Association

Date: March 7-9, 1960
Place: New York City (Hotel Astor)
Fee: \$150, members; \$175, non-members
Information: American Management Association, 1515 Broadway,
New York 36, New York

Data Processing: Electronics--The Input Bottleneck in Office Automation; Workshop Seminar #640-53, American Management Association

Date: March 23-25, 1960
Place: New York City (Hotel Astor)
Fee: \$150, members; \$175, non-members
Information: American Management Association, 1515 Broadway,
New York 36, New York

New Concepts in Planning and Installing Electronic Data Processing, sponsored by United Services Automobile Association

Date: April 4-8, 1960
Place: United Services Automobile Assn. Building, San Antonio, Texas
Instructor: Mr. Richard G. Canning
Fee: \$250.00
Information: Colonel A. T. Leonard, Vice President, United Services
Automobile Assn., U. S. A. A. Building, San Antonio, Texas

Management Concepts in Operations Research, presented by Harvey N. Shycon Company

Date: May 2-4, 1960
Place: Boston, Mass. (Harvard Club)
Fee: \$200
Information: Harvey N. Shycon Company, Park Square Building,
Boston, Massachusetts

University of Michigan Summer Courses, 1960, a program of intensive non-credit courses for practicing engineers and scientists including electronic data processing

Dates: June 13-24, 1960
Place: Ann Arbor, Michigan
Information: R. E. Carroll, Coordinator, Engineering Summer Courses,
2038 East Engineering Building, The University of Michigan,
Ann Arbor, Michigan

Meetings

IRE National Convention

Date: March 21-24, 1960
Place: Coliseum and Waldorf Astoria Hotel, New York, New York

Fourth Annual Symposium on Recent Advances in Programming Methods, conducted by the Central Ohio Association for Computing Machinery

Date: March 26, 1960
Place: Ohio State University, Columbus, Ohio
Information: R. K. Kissinger, Publicity Chairman
c/o Nationwide Insurance Companies
246 North High Street, Columbus, Ohio

TIMS-ORSA West Coast Meeting

Date: April 7, 8, 1960
Place: Monterey, California (U.S. Naval Postgraduate School)
Information: Daniel Teichroew, Stanford University, Stanford, California

Western Joint Computer Conference

Date: May 2-6, 1960
Place: San Francisco, California
Information: H. M. Zeidler, Stanford Research Institute, Menlo Park, Calif.

A. I. I. E. National Conference

Date: May 12-14, 1960
Place: Dallas, Texas (Sheraton-Dallas Hotel)
Fee: \$47.50, members; \$57.50, non-members
Information: American Institute of Industrial Engineers,
P. O. Box 914, Irving, Texas

Insurance Accounting and Statistical Association Annual Conference and Business Show

Date: May 15-18, 1960
Place: Chicago, Illinois (Sherman Hotel)
Information: I. A. S. A., P. O. Box 139, Kansas City 41, Missouri

Automatic Computing and Data Processing in Australia, Conference sponsored by The Australian National Committee on Computation and Automatic Control

Date: May 24-27, 1960
Place: Sydney (University of Sydney and University of New South Wales)
C. H. D. Harper, c/o The Institution of Engineers,
Science House, 157 Gloucester Street, Sydney, N. S. W.,
Australia

Conference, The Computing and Data Processing Society of Canada

Date: June 6, 7, 1960
Place: University of Toronto
Information: J. H. Aitchison, 600 Eglinton Ave., E.,
Toronto, Ontario, Canada

National Machine Accountants Association National Conference

Date: June 22-24, 1960

Place: San Francisco, California

Program: On Tuesday, June 21, a pre-conference tour will be conducted to outstanding data processing centers in nearby areas. In addition to the regular meetings, a Hall of Discussions will be held during the conference which will feature questions of general interest discussed informally. Following the conference, registrants may continue to Honolulu for a two-day meeting beginning on Monday, June 27, featuring data processing experts from the Pacific Basin and Asia.

Information: Address inquiries to 1960 National Conference, NMAA, P.O. Box 3617, Rincon Annex, San Francisco 19, California

Conference, British Computer Society, Ltd.

Date: July 4-7, 1960

Place: Harrogate, Yorks, England

Information: Miss D. E. Pilling, Electronic Computing Laboratory, The University, Leeds 2, England

Symposium on Computers and Data Processing, sponsored by University of Denver

Date: July 28, 29, 1960

Place: Estes Park, Colorado, Stanley Hotel

Information: W. H. Eichelberger, Denver Research Institute, University Park, Denver 10, Colorado

National ACM Conference

Date: August 23-25, 1960

Place: Marquette University, Milwaukee, Wisconsin

SHARE XV Meeting

Date: September 12-16, 1960

Place: Pittsburgh, Pa. (Pittsburgh Hilton Hotel)

Information: E. B. Weinberger, Gulf Research & Development Co., Drawer 2038, Pittsburgh 30, Pa.

NABAC National Convention

Date: October 10-12, 1960

Place: Los Angeles, California

Information: NABAC, The Association for Bank Audit, Control and Operation, 38 South Dearborn St., Chicago 3, Illinois

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